



# OPHTHALMIC NOTES.

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TREPHINING THE CORNEA TO REMOVE A FOREIGN BODY DEEPLY EMBEDDED IN ITS SUBSTANCE. By C. R. AGNEW, M.D., New York.

M. C., æt. 30, a fireman in gas-works, consulted me on September 10th, 1873, for kerato-iritis of five months' duration, produced by the deep lodgement of an extremely small foreign body in the cornea.

Scattered over the area of the cornea were numerous cloud-like opacities, some deep and some superficial; there was marked ciliary injection, discolored, mossy-looking iris, with sluggish, irregular pupil, restrained but not fixed by three or four very small adhesions of synechia posterior.

The ciliary neurosis was very annoying, and, combined with some sympathetic irritation in the fellow eye, had for some months kept the subject from work.

Opposite the infero-nasal margin of the pupil in the cornea there was a very minute ulcer surrounded by a circular opacity. This opening led obliquely to a sinus, in the bottom of which, apparently as deep as the membrane of Descemet, was an extremely minute black foreign body. To this unremoved foreign body I attributed the kerato-iritic inflammation, as the subject remembered the fact of his having got a bit of coke or coal in his eye, and of the immediate inflammatory consequences. I attempted to remove the foreign body from the bottom of the sinus, using delicately, for the purpose, various forms of spuds and needles, but without avail. I could easily explore the sinus in the corneal tissue down to the bed of the foreign body on the membrane of Descemet, but without being able to dislodge the foreign body except at the risk of pushing it into the anterior chamber. Drs. Pomeroy and Webster



examined the case by means of oblique illumination and the ophthalmoscope, and agreed with me as to its nature, and that the very minute black speck in the bottom of the sinus was not a pigmentary product in the inflamed cornea. It was evident that enucleation was inevitable unless the foreign body could be removed. It occurred to me, as I could not remove the foreign body alone, that I might remove, by means of the trephine, the disc of corneal tissue which included it, and thus remove the cause of the kerato-iritis and of the sympathetic trouble in the fellow eye. We placed the patient under ether, held the eye under fixation forceps, and without difficulty removed a disc of corneal tissue, the exact centre of which was the opening of the sinus holding the foreign body. Although we applied the trephine perpendicularly to the corneal surface, we did not cut through into the anterior chamber so as to complete the circle at once, but so as to leave a small segment of the deep surface of the disc to be cut by the scissors. Removing the disc and examining the sinus in its centre, no foreign body could be found, as the black speck had disappeared. This speck had not dropped through the sinus into the anterior chamber, as there was no opening in that direction; it could not be found floating on the surface of the eyeball, or in the inferior conjunctival cul-de-sac, and it is not probable that it got into the anterior chamber through the wound made by the trephine, as the kerato-iritis soon subsided and the eye regained a healthy state, and all sympathetic trouble in the fellow eye disappeared. The question remains, what became of the extremely minute black speck which was seen in the cornea before the operation, and could not be found in the disc of corneal tissue removed. In using the corneal trephine it is observed that the disc of tissue which it cuts out is more or less crumpled by the rotatory motion, and reasoning upon this fact, we were led to believe that the foreign body was worked out from the depth of the sinus, and washed away unseen by the free escape of aqueous humor and tears. No prolapse of iris followed the trephining, and under simple dressing, with a light bandage, the eye soon recovered without synechia anterior.

The symptoms of kerato-iritis rapidly vanished, the cornea became much clearer except where the scar was left by the trephine.

This scar, when mature, was only about half the diameter of the calibre of the instrument. I did not feel justified, in this case, in attempting to remove the foreign body by any of the methods previously recorded, and the history of the case, followed for many months subsequent to the operation, seems to ensure a beneficent result. Although the existence of slight synechia posterior guarded this subject against the occurrence of prolapse of the iris through the wound made by the trephine, we would not hesitate to resort to the use of the trephine for the removal of a deeply embedded and immovable corneal foreign body, even though a synechia anterior might result, the danger resulting from a synechia anterior being less than that from a foreign body remaining permanently embedded in the cornea.

A CASE OF DOUBLE, EXTREMELY MINUTE, AND APPARENTLY CONGENITAL LACHRYMAL FISTULA. By C. R. AGNEW, M.D., New York.

THE case was that of a girl three years of age, in excellent health and of healthy parentage.

A year previously to the date of my examination, December 5th, 1873, a minute drop of clear fluid was observed exuding from the region of the left lachrymal sac at a point immediately below the tendon of Horner's muscle. Six months afterwards a similar drop of fluid was observed over the right sac. In neither case was there, or had there been, the faintest trace of inflammatory action about the eyes, or any tendency to blepharitis or catarrh. I first saw the child on December 5th, 1873, and observed its good health and entire freedom from any trace of eye disease or want of full facial development. The parts about the internal canthi were well formed, and might have been taken as models of anatomical perfection. Immediately beneath the horizontal elevation made by the tendon of Horner's muscle, and over the centre of the corresponding portion of the lachrymal sac of each eye, might be seen, on careful scrutiny, an extremely minute capillary opening, from which the merest drop of pellucid fluid would exude on pressure, or spontaneously. The margins of the fistulæ were not raised in the least above or depressed below the surface of the surrounding skin, nor were they in the slightest degree inflamed or otherwise changed in color. The little fistulæ were so extremely minute that they were scarcely to be distinguished, except when a little dew-like moisture exuded. The puncta seemed to be well formed and patulous. The parents stated



that sometimes after crying, the fistulæ would discharge tears in small quantity, but entirely unaccompanied by any local inflammatory action. I did not feel justified in resorting to any form of surgical interference, contenting myself with asking to see the case, should any change occur.



A CONTRIBUTION TO THE STATISTICS OF CATARACT EXTRACTION OF ONE HUNDRED AND EIGHTEEN RECENT CASES. By C. R. AGNEW, M.D.

THE cases in the tables that follow are given as they occurred, and without selection or exclusion.

They include several in which the most unfavorable prognosis was declared, and in which the bare chance of a good result was accepted by the subject.

Some of the desperate cases did well, and some in which a favorable prognosis had been declared did badly, thus showing that however carefully we may weigh probabilities we are liable to error, and that those who are blind with even seriously complicated cataract are entitled to a the chances of a good method of operating.

The methods of operating used were those known as Graefe's, Liebreich's, Lebrun's, and the "old flap." My opinion has at times been much unsettled as to the method which offers the best prospect for useful vision in the greatest number of cases. I have, however, about come to the conclusion that the Graefe operation is the best, provided the middle of the cut is not made far from the junction of the sclerotic and clear cornea.

An insufficient wound is the most dangerous complication of a cataract extraction. Some of the so-called membranes in the pupil were so delicate as to be detected only by careful scrutiny with the ophthalmoscope or oblique illumination.

I have great pleasure in saying that most of the work of watching and recording the cases has been done by my assistant, Dr. David Webster, whose accuracy and carefulness are proverbial.

EXTRACTIONS BY VON GRAEFES METHOD.

No. of Case.	Sex.	Age.	General Condition.	Character of Cataract.	Complications.	Anaesthetic.	Section Upwards.	Section Downwards.	Accidents in Operation.	Complications during Recovery.	Secondary Operations.	Resulting Vision.
1	F.	69	.....	Hard.....	.....	None.....	.....	1	.....	.....	.....	V. = $\frac{1}{9}$
2	M.	65	.....	Hard.....	.....	None.....	.....	1	.....	.....	.....	V. = $\frac{20}{50}$
3	M.	65	.....	Hard.....	.....	{ Ether } { and } { Chlor. }	.....	1	Spoon used.	Membrane in pupil	1 needling.	V. = $\frac{1}{10}$
4	F.	(?)	.....	Hard.....	.....	Ether.....	.....	1	.....	Membrane in pupil	4 needlings	V. = $\frac{20}{40}$
5	F.	68	.....	Hard.....	Staph. post. } touching macula. }	Ether.....	.....	1	.....	Membrane in pupil	1 needling.	V. = $\frac{1}{40}$
6	M.	65	.....	Hard.....	.....	Chlor.....	.....	1	.....	Membrane in pupil	1 needling.	V. = $\frac{20}{100}$
7	M.	58	Insane...	Hard.....	.....	Ether.....	.....	1	.....	.....	.....	V. = 0
8	F.	62	.....	Hard.....	.....	Chlor.....	.....	1	.....	.....	.....	V. = $\frac{20}{30}$
9	F.	62	.....	Hard.....	.....	Chlor.....	.....	1	.....	Membrane in pupil	1 needling.	V. = $\frac{3}{5}$
10	M.	76	Feeble...	Hard.....	.....	Ether.....	.....	1	.....	.....	.....	V. = $\frac{1}{8}$
11	M.	43	Corpulent.	Semifluid.	.....	Ether.....	.....	1	{ Some } { vitreous } { lost. }	{ Iritis with clos- } { ure of pupil. }	{ 1 iridec- } { tomy, } { 1 kera- } { tonoxia. }	V. = 0
12	M.	75	.....	Hard.....	.....	Ether.....	.....	1	.....	.....	.....	V. = $\frac{20}{30}$
13	M.	49	.....	Hard.....	.....	Ether.....	.....	.....	.....	{ Iritis with clos- } { ure of pupil. }	{ 1 iridot- } { omy, } { 1 need- } { ling. }	V. = $\frac{20}{100}$
14	M.	43	{ Diabetic } { Cataract. }	.....	Diabetis.....	Ether.....	.....	.....	.....	.....	.....	“ Reads ordi- nary print.”

15 M. 76	Hard.....	Ether.....	1	.....	.....	V. = $\frac{20}{40}$
16 M. 76	Hard.....	Ether.....	1	.....	.....	V. = $\frac{20}{70}$
17 M. 43	Hard.....	None.....	1	.....	Iridotomy..	V. = $\frac{20}{30}$
18 M. 49	Hard.....	None.....	.....	.....	.....	V. = $\frac{20}{30}$
19 M. 43	Hard.....	Ether.....	.....	.....	.....	V. = $\frac{1}{12}$
20 M. 73	Hard.....	None.....	1	.....	.....	V. = Counts fingers.
21 F. 68	Hard.....	None.....	1	.....	Iridotomy..	V. = $\frac{20}{70}$
22 F. 45	Hard.....	Ether.....	1	.....	Membrane in pupil	V. = $\frac{20}{200}$
23 M. 61	Hard.....	Ether.....	1	.....	.....	V. = $\frac{20}{70}$
24 F. 65	Hard.....	Ether.....	1	.....	.....	V. = $\frac{20}{30}$
25 F. 71	Hard.....	Ether.....	1	.....	Iridotomy..	V. = Perception of light.
26 M. 60	Hard.....	{ Ether and Chlor. }	1	.....	.....	V. = $\frac{20}{40}$
27 F. 63	Hard.....	{ Ether and Chlor. }	1	.....	.....	{ V. = Sees to go about alone. }
28 M. 54	Hard.....	{ Ether and Chlor. }	1	.....	Membrane in pupil Keratonyxis	V. = $\frac{20}{30}$
29 M. 75	{ Black Cataract. }	{ Ether and Chlor. }	1	.....	{ Hemorrhage from choroidal vessels. }	V. = 0



No. of Case.	Sex.	Age.	General Condition.	Character of Cataract.	Complications.	Anæsthetic.	Section Upwards.	Section Downwards.	Accidents in Operation.	Complications during Recovery.	Secondary Operations.	Result in Vision.
30	M.	43	Corpulent.	Semifluid.	{ Detachment of retina of fellow eye }	None	1	1	{ Hyaline ruptured before section was complete; spoonused; some vitreous lost. }	{ Thick membrane formed }	{ Paracentesis; iridotomy }	V. = $\frac{20}{30}$
31	F.	35	Poor.	Semifluid.	.....	{ Ether and Chlor. }	1	.....	.....	Membrane in pupil	Keratomyxis	V. = $\frac{20}{20}$
32	F.	70	.....	Hard.	.....	{ Ether and Chlor. }	1	.....	.....	.....	.....	V. = $\frac{20}{200}$
33	M.	60	{ Gouty; enlarged knuckles }	Hard.	.....	None	1	1	.....	Membrane in pupil	.....	{ V. = Counts fingers. }
34	F.	72	Good	Hard.	.....	None	1	1	.....	.....	.....	V. = $\frac{20}{30}$
35	F.	62	{ Paralysis Agitans. }	Hard.	{ Myopia with staph. post. }	Ether	1	1	.....	Membrane in pupil	Keratomyxis	V. = $\frac{20}{20}$
36	M.	57	.....	Hard cataract; fluid vitreous, and tough capsule. Congenital atrophy of fellow eye.	.....	None	.....	1	.....	.....	.....	V. = $\frac{20}{20}$
37	M.	48	Poor	.....	.....	None	1	1	.....	Conjunctivitis.	.....	V. = $\frac{20}{100}$

38 M.	47	Good.....	Hard.....	.....	None.....	1	.....	.....	V. = $\frac{20}{40}$
39 M.	57	Poor.....	Hard.....	.....	None.....	1	.....	{ Iritis; mem- brane in pupil. }	V. = $\frac{20}{30}$
40 M.	81	Marasmatic	Hard.....	.....	None.....	1	.....	.....	V. = $\frac{20}{40}$
41 M.	58	Poor.....	Hard.....	Myopia.....	Chlor.....	1	.....	.....	V. = $\frac{10}{80}$
42 F.	76	Asthma...	Hard.....	{ Visual field doubtful on nasal side. }	Ether.....	1	.....	{ Cornea col- lapsed and wrinkled. }	V. = $\frac{20}{200}$
43 F.	75	{ General senile atrophy }	{ Hard nucleus; soft cortex. }	.....	Ether.....	1	.....	{ Pupil filled with soft lens matter }	V. = $\frac{20}{200}$
44 F.	57	Good....	Hard.....	Opacity of cornea.	Ether.....	1	.....	.....	V. = $\frac{20}{200}$
45 F.	57	Good....	Hard.....	Opacity of cornea.	Ether.....	1	.....	.....	V. = $\frac{20}{200}$
46 F.	56	{ Had general dropsy twice; very weak. }	Semifluid.	.....	Ether.....	1	.....	{ Iritis; mem- brane in pupil. }	{ V=Un- known. }
47 F.	58	Dyspeptic.	{ Small nucleus; much soft cortex. }	.....	Ether.....	1	.....	.....	V. = $\frac{20}{100}$
48 F.	74	Feeble....	Hard.....	.....	Ether.....	1	.....	{ Iritis; mem- brane in pupil. }	V. = $\frac{20}{100}$
								{ Lens shaky, showing rup- ture of hya- line before section com- pleted; cor- nea wrinkled. }	

No. of Case.	Sex.	Age.	General Condition.	Character of Cataract.	Complications.	Anæsthetic.	Section Upwards.	Section Downwards.	Accidents in Operation.	Complications during Recovery.	Secondary Operations.	Resulting Vision.
49	M.	74	{ Dyspeptic and half starved.	{ Hard	.....	Ether..	1	{ Hemorrhage from limbus into ant. chamber; cornea wrinkled.	{ Membrane in pupil.	.....	.....	V. = $\frac{20}{200}$
50	F.	60	{ Rheumatic and dyspeptic.	{ Hard	.....	Ether..	1	{ Cornea wrinkled.	.....	.....	.....	V. = $\frac{20}{50}$
51	M.	61	{ Good	{ Calcareous degeneration of capsule. Old chorooiditis; fluid vitreous.	.....	Ether..	1	{ Extracted capsule with forceps after ext. of lens.	.....	.....	.....	V. = $\frac{20}{100}$
52	M.	55	.....	{ Fellow lost by Extr. (panophthalmitis).	.....	None ..	1	{ Lens in capsule extruded with vitreous by spasm of orbicularis.	{ Hyalitis.	.....	.....	{ V. = Sees to go about alone.
53	E.	67	{ Goitre; catarh.	{ Hard	.....	None ..	1	{ Iris fell before knife and was cut. Bleeding into ant. chamb. from limbus; small fragment of cortex left in centre of pupil.	{ Delicate membrane in pupil.	.....	.....	V. = $\frac{20}{30}$
54	F.	58	{ Mother of 14 Children.	{ Hard nucleus; soft cortex.	.....	Ether..	1	{ Hyaline gave way on completion of iridectomy; removed lens with scoop; lost vitreous and left some cortex in field of pupil.	{ Iritis; membrane in pupil.	.....	.....	V. = $\frac{16}{50}$
55	M.	61	{ Smokes from 6 to 10 pipes a day.	{ Hard	.....	None ..	1	.....	{ Eye lost by Hyalitis.	.....	.....	V. = 0





No. of Case.	Sex	Age.	General Condition.	Character of Cataract.	Complications.	Anaesthetic.	Section Upwards.	Section Downwards.	Accidents in Operation.	Complications during Recovery.	Secondary Operations.	Resulting Vision.
70	M.	60										{ "Reads ordinary print," V. = $\frac{20}{40}$
71	F.	55					1	1	{ Lens brought out with spoon.			V. = "Reads ordinary print."
72	F.	37									Needling	V. = $\frac{20}{100}$
73	F.	47					1	1	Spoon used to remove lens	Capsular opacity		V. = $\frac{20}{50}$ V. = 0 V. = $\frac{20}{200}$
74	M.	54				Chlor.	1	1				Unknown.
75	F.	67				None.	1					{ "Reads ordinary print," V. = 0 V. = $\frac{20}{40}$
76	M.	64				None.	1					
77	F.	63				None.	1					
78	F.	70				None.	1					
79	M.	54				Chlor.						
80	F.	65				None.	1	1		Panophthalmitis		
81	F.	69	{ Rheumatic and dyspeptic.	Hard.	{ Small cornea, } 5" diameter.	Ether.	1	1	{ Dialysis of iris produced by point of knife in making section which was enlarged with scissors.	{ Iritis without pain—membrane in pupil.		V. = $\frac{20}{60}$
82	F.	40	Nervous.	Hard.		Ether.	1	1				V. = $\frac{20}{60}$



83	F. 38	Good ...	Soft—traumatic.	None	Ether.. 1	.....	.....	.....	V. = $\frac{20}{30}$
84	F. 66	{ Subject to attacks of erysipelas. }	Hard.....	.....	Ether.. 1	.....	.....	.....	V. = $\frac{20}{30}$
85	F. 64	Corpulent.	Hard.....	.....	Ether.. 1	.....	.....	.....	V. = $\frac{20}{60}$

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EXTRACTIONS BY LIEBREICH'S METHOD.

No. of Case.	Sex.	Age.	General Condition of Patient.	Character of Cataract.	Complications.	Accidents in Operation.	Condition of eye after operation.	Complications during Recovery from Operation.	Secondary Operations.	Resulting Vision.
1	F.	45	Poor.....	Hard.....	.....	.....	Pupil clear and circular. } Pupil clear and circular }	Catarrhal conjunctivitis and immobility of lower segment of iris.	.....	V. = $\frac{20}{30}$
2	M.	40	Fair.....	Pasty .. {	Atrophy of fellow eye from needling. } 11 needlings had caused absorption of lens in the other eye. }	..... } ..... } Prolapse of iris successfully reduced. }	..... } ..... } Pupil clear and circular. }	..... } ..... } Prolapse of iris; iritis; closure of pupil. }	..... } ..... } Iridotomy.. }	V. = $\frac{20}{30}$
3	F.	21	Fair.....	Semifluid.	.....	.....	.....	.....	.....	V. = $\frac{20}{100}$

No. of Case.	Sex	Age	General Condition of Patient.	Character of Cataract.	Complications.	Accidents in Operation.	Condition of Eye after Operation.	Complications during Recovery from Operation.	Secondary Operations.	Resulting Vision.
4	M.	60	Fair	Hard			{ Pupil clear and circular. }	{ Soft lens matter seen in pupil 48 hours after extraction. }	Keratomyxis.	V. = $\frac{20}{20}$
5	F.	63	Good	Hard			{ Pupil clear and circular. }			V. = $\frac{20}{20}$
6	F.	35	Poor	traumatic			{ Pupil clear and circular. }	{ Soft lens matter seen in pupil a few days after extraction; serous iritis. }	Paracentesis	V. = $\frac{20}{200}$
7	M.	40	Poor	Traumatic	{ Leucoma; Synech. post. and ant.; fluid vitreous. }	{ Loss of vitreous; collapse of cornea; spoon used. }	{ Collapsed eyeball. }	{ Panophthalmitis. }		V. = $\frac{0}{0}$
8	F.	56	{ Excessively nervous. }	Hard			{ Pupil clear and circular. }	{ Catarrhal conjunctivitis; immobility of lower segment of iris; membrane in pupil. }		V. = $\frac{20}{200}$
9	M.	50	{ Weighs 325 lbs. }	Hard			{ Pupil clear and circular. }	{ Prolapse of iris 24 hours after extraction. }	{ Excision of prolapsed iris. }	V. = $\frac{20}{100}$
10	F.	34	Very poor	{ Inflammatory }	{ Extreme myopia; atrophy of choroid. }		{ Pupil clear and circular. }	{ Cortical matter in pupil some days later; membrane. }	Keratomyxis.	V. = $\frac{1}{20}$
11	M.	60	{ Thin and wiry. }	Hard			{ Pupil clear and circular. }	{ Catarrhal conjunctivitis; membrane in pupil. }	{ Keratomyxis. }	{ V. = Percep. of light. }



EXTRACTIONS BY LEBRUN'S METHOD.

No. of Case.	Sex.	Age.	General Condition of Patient.	Character of Cataract.	Complications.	*Anesthetic.	Accidents in Operation.	Complications during Recovery.	Secondary Operations.	Resulting Vision.
1	F.	60	{ Gouty; rheumatic knuckles; neuralgia }	{ Hard nucleus; soft cortex. }	.....	None.	{ Iridectomy of pupillary border of iris; soft lens matter milked out; cornea flaccid. }	{ Membrane in pupil absorbed without any secondary operation. }	.....	V. = $\frac{20}{20}$
2	F.	70(?)	.....	{ Hard nucleus; soft cortex. }	.....	None.	{ Soft lens matter milked out and pupil left clear; marginal iridectomy. }	{ Slight serous iritis. }	{ ..... }	V. = 'Reads ordinary print easily.'
3	F.	65	Poor.....	{ Hard nucleus; soft cortex. }	{ Fellow eye lost by inflammation following extraction. }	None...	{ Blood and cortical left in pupil. }	{ No inflammatory reaction. }	.....	V. = $\frac{20}{60}$
4	F.	35	Feeble.....	Soft.....	.....	None..	.....	.....	.....	V. = $\frac{20}{30}$
5	F.	44	Marasmic....	Semifluid..	{ Synech. post. Previous iridectomy. }	None...	.....	{ No inflammatory reaction. }	.....	{ V. = Counts fingers. }
6	F.	44	Marasmic....	Semifluid..	Synech. post. ...	None.	{ Lebrun's section with iridectomy. The capsule was so tough that it had to be extracted by forceps before the lens would move from its fossa. }	{ No inflammatory action. }	.....	{ V. = Counts fingers. }



EXTRACTIONS BY THE OLD FLAP METHOD.

No. of Case.	Sex.	Age.	General Condition of Patient.	Character of Cataract.	Complications.	Anaesthetic.	Flap Upwards.	Flap Downwards.	Accidents in Extraction.	Complications during Recovery.	Secondary Operations.	Resulting Vision.
1	M.	55	Good.	Hard.		None.	1					V. = $\frac{20}{40}$
2	M.	80	Atrophy of old age.	Hard.			1					V. = $\frac{20}{40}$
3	F.	70	Fair.	Hard.		None.	1					V. = $\frac{20}{20}$
4	F.	65				None.		1		{ Prolapse of iris } { caused by fit of } { sneezing. }	{ Hook operation } { for pupillary } { membrane. }	V. = $\frac{20}{50}$
5	F.	61				Chlor.	1					V. = $\frac{20}{70}$
6	M.	53				Ether.	1				{ Keratonyxis for } { membrane. }	V. = $\frac{20}{40}$



STATEMENT OF RESULTS.

Graefe's.....	{	Successes.....	66	}.....	85
		Partial Successes.....	9		
		Failures.....	7		
		Unknown.....	3		
Liebreich's.....	{	Successes.....	15	}.....	21
		Partial Successes.....	2		
		Failures.....	4		
Lebrun's.....	{	Successes.....	4	}.....	6
		Partial Successes.....	2		
Flap.....		Successes.....			6
Total.....					<u>118</u>

Successes.....	91 = 77½ per cent.
Partial Successes.....	13 = 10½ per cent.
Failures.....	11 = 9½ per cent.
Unknown.....	3 = 2½ per cent.

Total..... 118

- In 11 cases V. =  $\frac{20}{20}$
- In 12 cases V. =  $\frac{20}{30}$
- In 1 case V. =  $\frac{16}{20}$
- In 1 case V. =  $\frac{3}{5}$
- In 14 cases V. =  $\frac{20}{40}$
- In 8 cases V. =  $\frac{20}{50}$
- In 5 cases V. =  $\frac{20}{60}$
- In 1 case V. =  $\frac{16}{50}$
- In 5 cases V. =  $\frac{20}{70}$
- In 2 cases V. =  $\frac{20}{80}$
- In 9 cases V. =  $\frac{20}{100}$
- In 2 case V. =  $\frac{1}{3}$
- In 1 case V. =  $\frac{1}{9}$
- In 11 cases V. =  $\frac{20}{200}$
- In 8 cases V. = Ability to read ordinary print.

91 cases reckoned as successes.

- In 1 case V. =  $\frac{1}{12}$
- In 1 case V. =  $\frac{5}{70}$
- In 2 cases V. =  $\frac{1}{20}$
- In 1 case V. =  $\frac{6}{200}$
- In 1 case V. =  $\frac{1}{40}$
- In 7 cases V. = Ability to get about alone, count fingers, etc., etc.
- 
- 13 cases reckoned as partial successes.
- In 9 cases V. = 0.
- In 2 cases V. = Faint perception of light.
- 
- 11 cases reckoned as losses.
- In 3 cases the result is unknown.

*Remarks.*

*Loss of vitreous* occurred 3 times in the 21 Liebreichs, or in  $14\frac{2}{7}$  per cent.; 4 times in the 85 Graefes or in  $4\frac{7}{10}$  per cent.; and not at all in the Lebruns and old Flap.

*The lens was removed by the scoop* in 5 Graefes, or about 6 per cent.; in 2 Liebreichs, or about  $9\frac{1}{2}$  per cent., and not at all in Flap or Lebruns.

*Prolapse of iris* occurred during recovery in the Liebreichs 4 times, about 19 per cent.; in the Flap once,  $16\frac{2}{3}$  per cent.; in the Graefes once, less than  $1\frac{1}{2}$  per cent., and in the Lebruns not at all.

*Cystoid cicatrix* occurred in one Graefe, and in none of the other methods.

*Synechia anterior* occurred in 2 Liebreichs where there had been no prolapse of iris.

*Immobility of the portion of iris below the cut*, either from synechia posterior, or from a localized iritis with interstitial thickening, was noted in *two* Liebreichs.

*Iritis with closure of pupil* occurred in 5 Graefes and in 1 Liebreich.

*Serous iritis* occurred in 2 Liebreichs and in 1 Lebrun.

*Panophthalmitis* occurred in 3 Liebreichs and in one Graefe.

*Hyalitis* occurred in 2 Graefes.

*Pupillary Membranes* formed in 20 Graefes and in 8 Liebreichs.

*Sympathetic Irido-choroiditis*, destroying both eyes, occurred in one Graefe.

*Notes of cases in which loss occurred after operation by Graefe's method.*

*Case 7.*—H. K., 58. Nothing peculiar observed in the physical condition of the patient, except that he was extremely loquacious and had acne rosacea. Extraction done December 1st. A small portion of pupillary margin of iris was cut off in making the section. On lacerating

the capsule fluid cortical substance flowed into and obscured the anterior chamber. The lens was easily extruded, but it seemed to be necessary to use a spoon to remove some small pieces of cortical from the anterior chamber. This patient took ether very quietly, and was left for a few moments by his attendant, after he had been informed of the safe removal of the cataract and replied that he was very comfortable. In the course of half an hour the patient was found to have removed, during the temporary absence of his attendant, the black silk mask and strips of isinglass plaster with which his eye had been closed, and to have dressed himself for a walk. The patient was, after much difficulty, put to bed again and his clothes hidden and the dressings renewed.

December 7th: Eye looks well; wound healed. Counts fingers readily.

December 25th: Eloped from hospital, having found his clothes and borrowed a hat.

January 5th: Returned again. Examined ophthalmoscopically and found to have retino-choroiditis with floating bodies in vitreous, and possibly a small retinal detachment.

*Case 11.*—J. F., 43, muscular, and corpulent. Extraction attempted by Graefe's method, December 15. It was impossible to produce complete anæsthesia of the eye by means of chloroform. The patient struggled excessively against the anæsthetic, and would suddenly become stertorous and asphyxiated, compelling efforts to be made for his partial resuscitation. Under these circumstances there was a premature loss of aqueous in the attempt to make the section, and we were forced to desist. The wound healed kindly, and on January 1st another attempt was made to operate, under ether. The ether affected the patient as badly as the chloroform had, and at no time could anæsthesia of the eye be accomplished, although a pint of ether was used in a cone. There was so much muscular rigidity and straining, that two or three persons were engaged in holding the patient while the ether was being assiduously administered. The section was, however, completed. In cutting out, the iris came in front of the knife, and was so cut as to leave the margin of the pupil intact, forming an isthmus, as it were, between a large irregular perforation and the pupil.



After lacerating the capsule, this isthmus-like segment of the pupillary margin was drawn out by means of forceps, and out with scissors in such a manner as to complete the coloboma. While performing this manipulation, the vitreous prolapsed, and two or three minims of it escaped in a gushing manner.

The eyes were closed with isinglass-plaster strips, and a black silk dressing.

As there was little or no pain, it was deemed wise, in view of the large amount of vitreous humor lost, not to open or expose the eye, especially as the removal of the outer dressing showed that there was neither swelling nor discoloration of the eyelids, nor any discharge.

January 15th: At this date the eye was opened, the cornea found to be clear, anterior chamber restored, circum-corneal injection slight. A slow iritis now set in without pain or increase of tension.

February 7th: Coloboma bridged over by a membrane.

At this date the patient, having good perception of light, was allowed to go home.

April 28th: We attempted to tear the membrane in the pupil by means of a stop-needle and sharp hook; patient under insufficient chloroform. Failed to secure an open pupil.

July 11th: Did an iredeotomy. Succeeded in removing a sufficient piece of iris from nasal side of the coloboma, but not in maintaining an open pupil.

October 10th: Needled the membrane. After recovering from this operation, the patient had good vision, enabling him to read and write in his occupation—that of a lawyer. After a lapse of several months, however, vision began to fail, and then suddenly went, and the ophthalmoscope revealed almost total detachment of the retina.

*Case 25.*—E. K. W., 71. Patient had marked senile atrophy. Eyelids and general skin flaxed and inelastic, and knuckles much enlarged by gouty deposits.

Graefe's operation done under ether and without accident or vomiting. Eye did badly from second day; corneal wound did not heal until 15th day. Choroiditis with large lymphoid effusions in anterior chamber, reduced V. to perception of light, and

so matted iris as to make any operation for secondary cataract hopeless.

This eye was enucleated some months afterwards by Prof. Bacon, of New Haven, who did a Liebreich upon fellow eye, resulting in useful vision.

*Case 29.*—H., æt. 75. Lenses have both begun to undergo secondary degeneration, have dark chocolate-colored nuclei, especially the left with striæ, and veins of a whitish calcific character mottling or marbling them. Right eye probably involved in an injury of that side of face in childhood, as there are extensive scars. V.=counts fingers in one foot. Patient is an old rheumatic, has marked senile marasmus, and is very feeble. V.=L. E. perception of light only. No limitation of visual field; phosphenes present.

October 13, 1874: L. E. operated upon by Graefe's method. Mixture of equal parts of ether and chloroform given.

The cornea was very flaccid, wrinkling after escape of aqueous; lens large and very dark-colored nucleus. No accident during the operation nor loss of vitreous. Isinglass plaster and black silk dressing applied.

October 14th: Has had little or no pain since operation. Slept well without hypnotic. During the night blood issued from beneath the dressings. This morning eye examined: blood oozing from ciliary region through wound. Atropia instilled; bandage and charpie applied. Had some bloody oozing, until 20th, when wound of cornea healed. On 30th October was discharged. Wound healed; coloboma still open and showing a dark, olive-colored reflex. V.=faint perception of light.

*Case 55.*—J. K., 61. Had right eye injured and vision impaired, by wound from foreign body, eight or ten years ago, resulting after some years in a cataract. Has a central scotoma; circumference of visual field unaffected.

November 12, 1873: Operated upon the right eye by Graefe's method, without anæsthetic. Speculum and fixation forceps used, and section made easily. Iridectomy made in usual manner. This was immediately followed by gushing escape of vitreous humor. Removed lens by means of a scoop, and was compelled by drainage of vitreous to leave some crumbs of cor-



tex in field of coloboma. Had severe pain first night, requiring anodyne.

November 13: Removed bandage and charpie; considerable secretion from conjunctiva; eyelids swollen; chemosis marked; cornea clear, but aqueous turbid; field of coloboma grayish; tension increased.

Instilled atropia, applied iced cloths, and leeched temple.

18th: Opened wound and evacuated anterior chamber.

29th: Eye remained in condition of chronic iritis for several days, with small hemorrhages into anterior chamber. Discharged with good perception of light.

*Case 75.*—E. C., 67. Marked premature senile marasmus.

L. E. operated by Graefe's method under ether, section downward, expecting in this way to obviate some of the difficulties of an operation. No accident attended operation, but cornea fell in a crumpled state into empty lenticular fossa. He had excessive, constantly recurring vomiting and retching for several days.

May 17th: Cornea sloughing, and anterior chamber and lenticular fossa suppurating. Soon sympathetic irido-choroiditis of a most painful character occurred in fellow eye, which was cataractous. Enucleation urged, but declined. Patient left Brooklyn Eye and Ear Hospital in a miserable state, and lost all perception of light, suffering exceedingly.

*Case 79.*—W. J. D., 54, April 15th, 1871. Right eye operated upon, Graefe's method, section upward. Chloroform given. Panophthalmitis set in on day following, sinking the eye.

*Notes of cases in which loss occurred after operation by Liebreich's method.*

*Case 7.*—M. H., æt. 40. Blown up by gunpowder fourteen years previously. The accident had destroyed and sunk right eye, but leaving it free from irritability. It had produced a perforating ulcer of the fellow eye, which healed with an extensive leucoma and synechia anterior, and slight synechia posterior. I had made an iridectomy upwards, at that time, restoring useful vision, which he had enjoyed until 1872, when, after receiving a blow upon the eye, cataract supervened, reducing

vision to perception of light. Testing his eye in 1873 for an operation, it was found that the lower portion of the visual field was blind, but whether from detachment of retina or choroido-retinal atrophy, we could not say. He was informed that the chances of a cataract extraction were all against him, but that it might possibly result in some vision.

A Liebreich was attempted, March 12th, 1873. The lens proved to be pasty or waxy, and the vitreous and aqueous commingled, so that the eyeball began to empty itself as the corneal section was made. The lens was removed, however, partly by pressure, partly by the aid of a spoon, and the eyes closed by means of strips of isinglass plaster and a black silk dressing.

March 13th: Some pain during night, but not so severe as to prevent natural sleep. Removed dressings; instilled atropia anterior chamber full.

March 13th, 5 P.M. Pain in forehead. Removed dressings; eyeball plump; cornea hazy; no perception of candle-light. Gave opium and repeated atropia.

8 P.M.: Pain in forehead and eye increased. Gave hypodermic of Sol. Morph. M., m. x., with entire relief of pain.

March 14th: Panophthalmitis, which ran its usual course spoiling eye.

*Case 11.*—W., 60. A thin and wiry man with sclerosis of all observable arteries. The operation (Liebreich) was without accident, but the eye recovered with a membrane in the pupil, reducing V. to  $\frac{2}{100}$ . Some weeks later, as V. lessened, the pupillary membrane was needled. This was followed by serous iritis, which yielded slowly to paracentesis, leeches, and atropia. After some weeks patient was allowed to go home. He returned in three weeks, with pupil closed, eyeball somewhat congested, tension minus, perception of light very uncertain.

*Case 16.* (Liebreich's).—H., æt. 70, farmer. Observable vessels sclerosed. Pupil sluggish. No anæsthetic used. Incision made easily. When the capsule was opened lens would not follow. Wound enlarged, but pupil would not stretch. I then tilted the lens by pressure on the upper part of the cornea, and delivered it by means of a flat spoon. No vitreous lost, nor was there very much violence inflicted. Operation done June 4, 1873.



June 5th: Removed flannel bandage and charpie; considerable conjunctival secretion; cornea transparent; pupil black; incision scarcely discernible; little or no injection of circumcorneal parts. Dropped in Sol. Atrop., and renewed bandage.

June 6th, 6 A.M.: Had severe throbbing, supra-orbital pain during the night, but did not ask for relief. Removed bandage. Conjunctival secretion marked; eyeball red; cornea cloudy. Atropia and iced cloths.

3 P.M.: Tension +. Opened wound and emptied anterior chamber.

Evening: Edge of flap beginning to show necrosis. Applied hot fomentations; gave quinine and tincture of iron.

June 10th: Eye gone by panophthalmitis.

*Case 21.* (Liebreich) D. B., æt. 64. A very tall, thin gentleman, who had had several severe attacks of bronchitis and been subject to syncope. Marked sclerosis of radial arteries and other superficial vessels. Eyes known to be myopic and to have posterior staphylomata. Corneal diameter  $5\frac{1}{2}''$ . Pupil mobile. The incision was easily made. In finishing the latter the lower margin of the pupil fell in front of the knife and was cut. The lens came out easily, pushing through the wound one or two tags of the cut iris, which were easily removed by the scissors. Every vestige of cortex was carefully removed by gently stroking and pressing the cornea, and without using the spoon, until the pupil seemed under oblique illumination in the focus of a two-inch lens to be clean and black. No vitreous was lost, nor was there any remaining prolapse of iris. Patient counted fingers immediately after the operation on October 22d, 1873. A light flannel bandage and charpie were applied. The patient did perfectly well until the fourth day—26th inst., when at 3.30 A.M. he was awakened by feeling as though he had struck his eye. This was followed by severe pain.

At 10 A.M. the eyelids were swollen, tender to the touch, and there was much circumorbital pain. The eyeball was reddened; the iris pressed forward against the cornea, which was still transparent. The pupil was still clear and not contracted. Atropia was instilled, leeches applied, and after encouraging the bleeding by hot fomentations, iced cloths were placed upon the closed eye and frequently changed. Quinine was given, and

such nutritious food as could be taken. In a comparatively few hours the interior of the eye seemed to be engaged in pyogenic action, and to furnish a free flow of pus, somewhat tinged with blood. Under this inflammatory action the cornea soon sloughed, the eye rapidly diminished in size, painlessly shrinking until it formed a bulb not more than four or five lines in diameter. We were impressed by the rapid diminution of the size of the eyeball. It seemed as though it quickly melted. There was very little pain after the pyogenic action was fairly set up, and at no time was much, if any, inflammatory action in the circumocular connective tissue. It occurred to me that the disaster might possibly be due to atheroma of one or more of the branches of the ophthalmic artery.